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PATENT 01AB121

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9/26/05
Date

John M. Ling

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:

Applicant(s): Frederick M. Discenzo, *et al.*

Serial No: 09/965,545

Filing Date: September 27, 2001

Examiner: Aaron C. Perez Daple

Art Unit: 2154

Title: MOTORIZED SYSTEM INTEGRATED CONTROL AND DIAGNOSTICS USING VIBRATION, PRESSURE, TEMPERATURE, SPEED, AND/OR CURRENT ANALYSIS

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APPEAL BRIEF

Dear Sir:

Appellants' representative submits this brief in connection with an appeal of the above-identified patent application. A credit card payment form is filed concurrently herewith in connection with all fees due regarding this appeal brief. In the event any

additional fees may be due and/or are not covered by the credit card, the Commissioner is authorized to charge such fees to Deposit Account No. 50-1063 [ALBRP112USB].

I. Real Party in Interest (37 C.F.R. §41.37(c)(1)(i))

The real party in interest in the present appeal is Reliance Electric Technologies, LLC, the assignee of the present application.

II. Related Appeals and Interferences (37 C.F.R. §41.37(c)(1)(ii))

Appellants, appellants' legal representative, and/or the assignee of the present application are not aware of any appeals or interferences which may be related to, will directly affect, or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. Status of Claims (37 C.F.R. §41.37(c)(1)(iii))

Claims 1-8, 12-22, and 24-42 are pending in the application. Claims 1-8, 12-22, and 24-42 stand rejected by the Examiner. The rejections of claims 1-8, 12-22, and 24-42 are being appealed.

IV. Status of Amendments (37 C.F.R. §41.37(c)(1)(iv))

Amendments to claims 19 and 22 have been entered after the Final Office Action.

V. Summary of Claimed Subject Matter (37 C.F.R. §41.37(c)(1)(v))

A. Independent Claim 1

Independent claim 1 recites a method for controlling a motorized system comprising: measuring an attribute of the motorized system, the attribute comprises at least one of vibration, speed, temperature, pressure, and current in the motorized system (*see, e.g.*, page 13, lines 9-14; *see also* Fig. 1); diagnosing a health of the motorized system based on the measured attribute (*see, e.g.*, page 13, lines 14-15; *see also* Fig. 1); providing a diagnostics signal based on the diagnosed health (*see, e.g.*, page 13, lines 15-22; *see also* Fig. 1); prognosing a state of the motorized system based at least in part on the at least one sensed attribute and/or the diagnosed state (*see, e.g.*, page 19, lines 15-17; *see also* the Abstract); providing a control signal based at least in part on the diagnosed health and the prognosed state (*see e.g.*, page 13, lines 22-24, *see also* Fig. 1; *see also*

page 20, line 19-page 21, line 1); and providing a feedback operation that adjusts the control signal to extend the lifetime of the motorized system to a specific time horizon (*see, e.g.*, page 24, line 26-page 25, line 3).

B. Independent Claim 19

Independent claim 19 recites a control system for controlling a motorized system comprising: means for measuring an attribute of the motorized system (*see, e.g.*, page 19, lines 6-27; *see also*, reference numerals 90 and 92 and associated Fig. 2b), the measured attribute comprises at least one of vibration, speed, temperature, pressure, and current in the motorized system; means for diagnosing a health of the motorized system (*see, e.g.*, page 19, lines 6-27; *see also*, reference numeral 94 and associated Fig. 2b); means for prognosing a state of the motorized system (*see, e.g.*, page 19, lines 6-27; *see also*, reference numeral 96 and associated Fig. 2b); means for providing a control signal based at least in part on both of a diagnosed health and a prognosed state of the motorized system (*see, e.g.*, page 19, lines 6-27; *see also*, reference numeral 98 and associated Fig. 2b); means for providing a diagnostic signal (*see, e.g.*, page 19, lines 6-27; *see also*, reference numeral 94 and associated Fig. 2b); and means for performing feedback analysis to adjust the control signal to extend motorized system lifetime to a specific time horizon (*see, e.g.*, page 19, lines 6-27; *see also*, reference numeral 98 and associated Fig. 2b; *see also, e.g.*, page 24, line 26-page 25, line 5; *see also* reference numerals 64 and 71 and associated Figs. 2a and 3-6).

C. Independent Claim 22

Independent claim 22 recites a system comprising: a motorized system; a communications link coupled to the motorized system; and a control system coupled to the communications link comprising: a controller coupled to the communications link adapted to operate the motorized system in a controlled fashion; a diagnostics system coupled to the communications link adapted to diagnose the health of the motorized system according to at least one measured attribute associated with the motorized system, the measured attribute comprises at least one of vibration, speed, temperature, pressure, and current in the motorized system; a prognostics system coupled to the communications

link that provides prognoses of future states of the motorized system based at least in part on the at least one sensed attribute and/or and the diagnosed health and provides the prognoses to the control component; and a feedback analysis component that adjusts the controller to increase motorized system life duration to a specific time horizon. (*See, e.g.*, page 14, line 15- page 27, line 1; *see also* Figs. 2a-6.)

D. Independent Claim 36

Independent claim 36 recites a system to facilitate controlling a motorized system, comprising: at least one sensor that senses at least one attribute of the motorized system, the attribute comprises at least one of vibration, speed, temperature, pressure, and current in the motorized system; a diagnostics system that diagnoses a state of the motorized system based at least in part on the at least one sensed attribute; a prognostic system that makes a prognosis of the motorized system based at least in part on the at least one sensed attribute, the diagnosed state, or both; and a controller that controls the motorized system based at least in part on the diagnosed state; the diagnostics system further performs at least a second diagnosis of the state of the motorized system after corrective action is taken by the control component and ensures that the motorized system will function until a predetermined time horizon is reached. (*See, e.g.*, page 14, line 15- page 27, line 1; *see also* Figs. 2a-6.)

VI. Grounds of Rejection to Be Reviewed (37 C.F.R. §41.37(c)(1)(vi))

A. Claims 1, 19, and 22 stand rejected under 35 U.S.C. §102(e) as being anticipated by McConnell *et al.* (U.S. 6,002,232).

B. Claims 1-5, 18-22, 24, 30, 35-38, 40 and 41 stand rejected under 35 U.S.C. §102(e) as being anticipated by Madhavan (U.S. 6,004,017).

C. Claims 6-8, 12-14, 25-29, and 42 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Madhavan (U.S. 6,004,017) in view of Hays *et al.* (U.S. 6,260,004).

D. Claims 15-17 and 31-34 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Madhavan (U.S. 6,004,017) in view of Edison *et al.* (5,586,305).

E. Claim 39 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Madhavan (U.S. 6,004,017) in view of Grayson *et al.* (U.S. 5,111,531).

VII. Argument (37 C.F.R. §41.37(c)(1)(vii))

A. Rejection of Claims 58-75 Under 35 U.S.C. §103(a)

Claims 1, 19, and 22 stand rejected under 35 U.S.C. §102(e) as being anticipated by McConnell *et al.* (U.S. 6,002,232). It is respectfully requested that this rejection be withdrawn for at least the following reasons. McConnell *et al.* fails to disclose each and every element of the subject claims.

> "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ 2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the...claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

The subject invention relates to systems and methods for controlling and diagnosing the health of a machine, and more particularly, to systems and methods for controlling and diagnosing motorized systems according to vibration, pressure, temperature, speed, and/or current analysis. Independent claim 1 sets forth "A method for controlling a motorized system comprising: measuring an attribute of the motorized system, the attribute comprises at least one of vibration, speed, temperature, pressure, and current in the motorized system; diagnosing a health of the motorized system based on the measured attribute; providing a diagnostics signal based on the diagnosed health; prognosing a state of the motorized system based at least in part on the at least one sensed attribute and/or the diagnosed state; providing a control signal based at least in part on the diagnosed health and the prognosed state; ***and providing a feedback operation that adjusts the control signal to extend the lifetime of the motorized system to a specific time horizon***." Independent claims 19 and 22 recite similar aspects. The subject

specification is replete with support for the claimed aspects: for instance, according to an example described at pages 24-25, "...an appropriate *control signal 64 may be provided* by the controller 71 to the motor drive 60 in order to avoid anticipated cavitation, *based on the diagnostics signal* 72 (*e.g.*, and/or the setpoint 19), *whereby the service lifetime* of one or more system components (*e.g.*, pump 14) *may be extended*. The control signal 64 can further be provided to reduce cavitation to a prescribed low level to meet process constraints and *to extend machinery lifetime to* ***a specific time horizon*** (*e.g.*, to allow for mission completion)." (Page 24, line 26 – page 25, line 3.) Moreover, "Subsequent diagnostics on the system with modified control *can confirm, in a feedback operation*...whether a new, *extended operating lifetime will be obtained.*" (Page 4, lines 20-23.) Thus, the subject claims set forth feedback-enabled control of a system to extend operating lifetime to a specific time horizon, rather than merely extending operating lifetime to some ambiguous future time. McConnell *et al.* does not describe such claimed aspects of the subject invention.

McConnell is directed toward suppressing vibration in a physical system *via* analysis of frequency spectra of a command input that is selected according to various parameters. The examiner contends that McConnell *et al.* describes the claimed aspect of "prognosing a state of the motorized system based at least in part on the diagnosed state," citing column 8, lines 42-50. However, the Examiner's cited section discusses selecting a command signal and evaluating a noise generation potential there for based on analysis of *a table lookup* of a frequency spectrum for the command signal, upon which aspect it appears the Examiner relies to describe prognosing a state of the system. If the analysis of the command signal attributes is satisfactory, then the command signal is applied to the system. *Only after application of the command signal* does McConnell *et al.* employ any diagnostic action. Thus, McConnell *et al.* does not disclose ***prognosing a state of a motorized system based on a diagnosed state of the system, but rather discusses employing a predicted value as determined from a table lookup*** to select a command signal that can be applied to a system to be diagnosed subsequently.

Additionally, McConnell *et al.* is silent with regard to the aspect of "***a feedback operation that adjusts the control signal to extend the lifetime of the motorized system to a specific time horizon,***" as set forth in the amended independent claims. Nowhere in

the Examiner's cited sections or otherwise does McConnell *et al.* even mention a feedback operation that adjusts a control signal to control system lifetime duration.

> "Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *Mehl/Biophile Int'l Corp. v. Milgraum*, 192 F.3d 1362, 1365, 52 USPQ2d 1303, 1305 (Fed. Cir. 1999), reh'g denied, 1999 U.S. App. LEXIS 31386 (Fed. Cir. Oct. 37, 1999) (*quoting In re Oelrich*, 666 F.2d 578, 581, 212 USPQ323, 326 (CCPA 1981)).

The Examiner maintains the contention that the claimed aspect of adjusting a control signal to extend system lifetime to a specific time horizon is inherent to the McConnell reference because McConnell *et al.* relates to vibration reduction and because unwanted vibrations reduce the lifetime of system components. The Examiner further points to Madhavan to illustrate that such would be understood by one skilled in the art. Still furthermore, the Examiner contends that by reducing vibrations, McConnell *et al.* inherently extends the lifetime of the motorized system to a specific time horizon, where a "specific time horizon" is interpreted broadly as referring to the time when the system will fail to operate consistently, predictably, or accurately, citing a definition from techdictionary.com.

The definition cited by the Examiner in the Final Office Action dated March 31, 2005 defines "time horizon" as "a point in time beyond which a system element will fail to process consistently..." The subject independent claims set forth a "specific time horizon," such as mission completion, *etc.*, to which system operation lifetime can be extended based on adjustments to a control signal that are facilitated by diagnoses and prognoses related to system health. Even if the Examiner's definition of "time horizon" were acceptable, nothing in the cited references describes controlling a system to ensure that the system operates beyond a *specific* time horizon. However, it is respectfully pointed out that dictionaries are no longer an acceptable basis for claim construction. (*See generally, Phillips v. AWH Corp.*, No. 03-1269, 75 USPQ2d 1321 (Fed. Cir. 7/12/05), (70 PTCJ 309 7/15/05).) Moreover, the mere fact that a system can be calibrated to reduce vibration does not inherently disclose providing control signal adjustments that extend

system operation lifetime to a *specific* time horizon. Thus, McConnell *et al.* fails to describe such aspects of appellants' claimed invention.

In view of the foregoing, it is readily apparent that McConnell *et al.* does not anticipate or make obvious the appellants' invention as recited in the subject claims. Therefore, this rejection should be withdrawn.

B. Rejection of Claims 1-5, 18-22, 24, 30, 35-38, 40 and 41 Under 35 U.S.C. §102(e)

Claims 1-5, 18-22, 24, 30, 35-38, 40 and 41 stand rejected under 35 U.S.C. §102(e) as being anticipated by Madhavan (U.S. 6,004,017). Withdrawal of this rejection is respectfully requested for at least the following reasons. Madhavan does not disclose each and every aspect of the present invention as set forth in the subject claims.

As stated above with regard to Section I, the subject independent claims set forth the aspect of *extending motorized system function until a specific time horizon is reached* based on diagnostic and prognostic information related to system health. As set forth with regard to McConnell *et al.*, Madhavan fails to disclose such aspects of the subject claims.

Madhavan merely discloses an algorithm for *predicting or avoiding* an episode of "chatter" in a machining tool. Chatter is a "self-excited relative vibration between the workpiece and the cutting tool in common machining processes such as turning processes on a lathe..." (Column 1, lines 30-33.) Madhavan does not disclose *adjusting a control signal to extend operating life to a specific time horizon* as set forth in the subject independent claims. As with McConnell *et al.*, the Examiner relies on an inherency argument to introduce the claimed aspect of the specific time horizon, contending that the stated object of the Madhavan invention is to extend the lifetime of a system, which the Examiner states, is equivalent to the claimed aspect of extending system lifetime operation to a specific time horizon. However, as stated above, the mere fact that a certain thing may result from a given set of circumstances is not sufficient to establish inherency.

Thus, Madhavan fails to anticipate or make obvious appellants' invention as set forth in independent claims 1, 19, 22, and 36 (and claims 2-5, 18-22, 24, 30, 35-38, and 40-41, which depend respectively there from). This rejection should be withdrawn.

C. **Rejection of Claims 6-8, 12-14, 25-29, and 42 Under 35 U.S.C. §103(a)**

Claims 6-8, 12-14, 25-29, and 42 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Madhavan (U.S. 6,004,017) in view of Hays *et al.* (U.S. 6,260,004). This rejection should be withdrawn for at least the following reasons. Neither Madhavan nor Hays *et al.*, alone or in combination, teach or suggest all of the claimed aspects of the present invention as set forth in the subject claims.

> To reject claims in an application under §103, an examiner must establish a *prima facie* case of obviousness. A *prima facie* case of obviousness is established by a showing of three basic criteria. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) ***must teach or suggest all the claim limitations.*** *See* MPEP §706.02(j). The ***teaching or suggestion to make the claimed combination*** and the reasonable expectation of success ***must both be found in the prior art and not based on applicant's disclosure.*** *See In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) (emphasis added).

As discussed above, independent claims 1, 22, and 36 set forth the aspect *of a feedback operation that adjusts a control signal to manipulate system lifetime duration.* Neither of the Examiner's cited references teaches or suggest such aspect of the claimed invention, as discussed above is Sections I and II.

Accordingly, it is readily apparent that neither Madhavan nor Hays *et al.*, alone or in combination, teach or suggest all of the claimed aspects of independent claims 1, 22, and 36 (and claims 6-8, 12-14, 25-29, and 42, which depend respectively there from). Withdrawal of this rejection is respectfully requested.

D. **Rejection of Claims 15-17, and 31-34 Under 35 U.S.C. §103(a)**

Claims 15-17 and 31-34 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Madhavan (U.S. 6,004,017) in view of Edison *et al.* (5,586,305). Withdrawal of this rejection is respectfully requested for at least the following reasons. Neither Madhavan nor Edison *et al.*, alone or in combination, teach or suggest the present invention as set forth in the subject claims.

Claims 15-17 and 31-34 depend from independent claims 1 and 22 respectively. As discussed above in Sections I-III, Madhavan does not teach or suggest "*a feedback operation that adjusts the control signal to extend the lifetime of the motorized system to a specific time horizon*" as set forth in independent claims 1 and 22. Edison *et al.* fails to overcome the deficiencies of Madhavan and McConnell *et al.* with respect to the subject independent claims.

In view of the above comments, it is respectfully submitted that the combination of Madhavan and Edison *et al.* does not make obvious the subject invention as recited in independent claims 1 and 22 (and claims 15-17 and 31-34 which respectively depend there from). Therefore, this rejection should be withdrawn.

E. **Rejection of Claim 39 Under 35 U.S.C. §103(a)**

Claim 39 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Madhavan (U.S. 6,004,017) in view of Grayson *et al.* (U.S. 5,111,531). Withdrawal of this rejection is respectfully requested for at least the following reasons. Claim 39 depends from independent claim 36, which, as discussed above in Section V, is not made obvious by Madhavan. Grayson *et al.* fails to overcome the deficiencies of Madhavan with respect to independent claim 36. Specifically, Grayson *et al.* does not teach or suggest a diagnostics system that "***ensures that the motorized system will function until a predetermined time horizon is reached.***"

Accordingly, this rejection should be withdrawn.

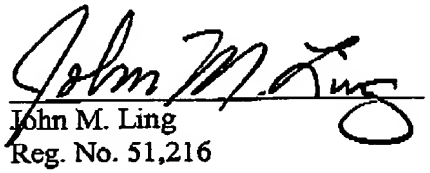
F. **Conclusion**

For at least the above reasons, the claims currently under consideration are believed to be patentable over the cited references. Accordingly, it is respectfully

requested that the rejections of claims 1-8, 12-22, and 24-42 be reversed.

If any additional fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063.

Respectfully submitted,
AMIN & TUROCY, LLP



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VIII. Claims Appendix (37 C.F.R. §41.37(c)(1)(viii))

1. (Previously Presented) A method for controlling a motorized system comprising:

measuring an attribute of the motorized system, the attribute comprises at least one of vibration, speed, temperature, pressure, and current in the motorized system;

diagnosing a health of the motorized system based on the measured attribute;

providing a diagnostics signal based on the diagnosed health;

prognosing a state of the motorized system based at least in part on the at least one sensed attribute and/or the diagnosed state;

providing a control signal based at least in part on the diagnosed health and the prognosed state; and

providing a feedback operation that adjusts the control signal to extend the lifetime of the motorized system to a specific time horizon.

2. (Original) The method of claim 1, further comprising operating the motorized system according to the diagnostics signal.

3. (Original) The method of claim 1, further comprising modifying a setpoint of the motorized system.

4. (Original) The method of claim 1, wherein diagnosing the health comprises obtaining a frequency spectrum of the measured attribute and analyzing the frequency spectrum to detect adverse operating conditions.

5. (Previously Presented) The method of claim 4, wherein analyzing the frequency spectrum comprises analyzing the frequency spectrum to detect faults, component wear and component degradation.

6. (Original) The method of claim 5, wherein measuring the attribute comprises measuring an attribute associated with a motorized pump.

7. (Original) The method of claim 1, wherein measuring the attribute comprises measuring an attribute associated with a fan.

8. (Original) The method of claim 1, wherein measuring the attribute comprises measuring an attribute associated with the motorized system selected from the group comprising motorized pump, fan, conveyor system, compressor, gear box, motion control device, screw pump, mixer, hydraulic machine and pneumatic machine.

9-11. (Cancelled)

12. (Original) The method of claim 1, wherein diagnosing the health comprises analyzing an amplitude of a first spectral component of a frequency spectrum at a first frequency.

13. (Original) The method of claim 1, wherein providing the control signal comprises providing the control signal to increase cavitation to reduce damage to the motorized system.

14. (Original) The method of claim 1, wherein providing the control signal comprises providing the control signal to reduce cavitation to extend an operating lifetime of the motorized system.

15. (Original) The method of claim 1, wherein providing the control signal comprises generating the control signal and transmitting the control signal via a wireless network.

16. (Original) The method of claim 1, wherein providing the diagnostic signal comprises generating the diagnostic signal and transmitting the diagnostic signal via a wireless network.

17. (Original) The method of claim 1 being implemented on a system connected to the motorized system via a wireless network.

18. (Original) The method of claim 1, wherein measuring the attribute comprises receiving measurements from at least one sensor.

19. (Previously Presented) A control system for controlling a motorized system comprising:

means for measuring an attribute of the motorized system, the measured attribute comprises at least one of vibration, speed, temperature, pressure, and current in the motorized system;

means for diagnosing a health of the motorized system;

means for prognosing a state of the motorized system;

means for providing a control signal based at least in part on both of a diagnosed health and a prognosed state of the motorized system;

means for providing a diagnostic signal; and

means for performing feedback analysis to adjust the control signal to extend motorized system lifetime to a specific time horizon.

20. (Original) The control system of claim 19, further comprising:

means for modifying operation of the motorized system based on the diagnostic signal.

21. (Original) The control system of claim 19, further comprising:

means for modifying operation of the motorized system based on the control signal.

22. (Previously Presented) A system comprising:

a motorized system;

a communications link coupled to the motorized system; and

a control system coupled to the communications link comprising:

a controller coupled to the communications link adapted to operate the motorized system in a controlled fashion;

a diagnostics system coupled to the communications link adapted to diagnose the health of the motorized system according to at least one measured attribute associated with the motorized system, the measured attribute comprises at least one of vibration, speed, temperature, pressure, and current in the motorized system;

a prognostics system coupled to the communications link that provides prognoses of future states of the motorized system based at least in part on the at least one sensed attribute and/or and the diagnosed health and provides the prognoses to the control component; and

a feedback analysis component that adjusts the controller to increase motorized system life duration to a specific time horizon.

23. (Cancelled)

24. (Original) The system of claim 22, wherein the motorized system comprises components, devices, subsystems and process controls.

25. (Original) The system of claim 24, wherein the components comprise bearings, the devices comprise a motor, pump and fan, the subsystems comprise a motor-drive-pump and process controls comprise a pump fluid control.

26. (Original) The system of claim 22, wherein the motorized system comprises a motor and a load, and wherein the load comprises at least one of a valve, a pump, a conveyor roller, a fan, a compressor, and a gearbox.

27. (Original) The system of claim 24, wherein the diagnostics system provides a diagnostics signal, and wherein the controller provides a control signal.

28. (Original) The system of claim 27, wherein the diagnostics signal represents health of the motorized system and the control signal represents control information for the motorized system.

29. (Original) The system of claim 24, wherein the controller provides a control signal, wherein the control signal contains control information for controlling at least one of the components, the devices, the subsystems and the process controls.

30. (Original) The system of claim 22, further comprising at least one sensor coupled to the motorized system and the communications link for measuring the at least one measured attribute.

31. (Original) The system of claim 22, wherein the communications link is a wired connection.

32. (Original) The system of claim 22, wherein the communications link is a wireless connection.

33. (Original) The system of claim 22, wherein the communications link is a wireless radio frequency system.

34. (Original) The system of claim 22, wherein the communications link is a wireless network.

35. (Original) The system of claim 22, wherein the control system is implemented on a computer system.

36. (Previously Presented) A system to facilitate controlling a motorized system, comprising:

at least one sensor that senses at least one attribute of the motorized system, the attribute comprises at least one of vibration, speed, temperature, pressure, and current in the motorized system;

a diagnostics system that diagnoses a state of the motorized system based at least in part on the at least one sensed attribute;

a prognostic system that makes a prognosis of the motorized system based at least in part on the at least one sensed attribute, the diagnosed state, or both; and

a controller that controls the motorized system based at least in part on the diagnosed state;

the diagnostics system further performs at least a second diagnosis of the state of the motorized system after corrective action is taken by the control component and ensures that the motorized system will function until a predetermined time horizon is reached.

37. (Original) The system of claim 36, the controller controlling the motorized system based at least in part on the prognosis.

38. (Original) The system of claim 37, the controller automatically adjusting operation of the motorized system based at least in part on prognosed future states of the motorized system.

39. (Original) The system of claim 36, the prognostic system comprising a non-linear training system.

40. (Original) The system of claim 36, the prognostic system inferring future operating states of the motorized system.

41. (Original) The system of claim 36, the controller automatically adjusting an operating state of the motorized system based at least in part on the prognosis.

42. (Original) The system of claim 36, the controller scheduling preventive maintenance for the motorized system based at least in part on the prognosis.

IX. Evidence Appendix (37 C.F.R. §41.37(c)(1)(ix))

None.

X. Related Proceedings Appendix (37 C.F.R. §41.37(c)(1)(x))

None.